

2010 Project

To determine the function of 25,000 genes in *Arabidopsis thaliana* by the year 2010

Program Solicitation

NSF 01-13

DIRECTORATE FOR BIOLOGICAL SCIENCES

DEADLINE(S): January 31, 2001



NATIONAL SCIENCE FOUNDATION



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: 2010 Project

Synopsis of Program: The Directorate for Biological Sciences (BIO) of the National Science Foundation (NSF) announces its intention to support research to determine the function of all genes in the model plant *Arabidopsis thaliana* by the year 2010. Individual investigators or groups of investigators will be supported to conduct creative and innovative research designed to determine, using all available means, the function of a network of genes of the investigator's interest and choice. Also supported will be development of critical research tools for *Arabidopsis* functional genomics that enable a broad community of scientists to participate in the 2010 Project.

Cognizant Program Officer(s):

- Dr. Machi F. Dilworth, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: bio2010@nsf.gov.
- Dr. Judith A. Verbeke, Division of Integrative Biology and Neuroscience, telephone: (703)292-8420, e-mail: bio2010@nsf.gov.
- Dr. Parag Chitnis, Division of Molecular and Cellular Biosciences, telephone: (703)292-8440, e-mail: bio2010@nsf.gov.
- Dr. James E. Rodman, Division of Environmental Biology, telephone: (703)292-8481, e-mail: bio2010@nsf.gov.
- Dr. Mary Jane Saunders, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: bio2010@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.074 --- Biological Sciences

ELIGIBILITY INFORMATION

- **Organization Limit:** Proposals are invited from U.S. academic institutions, U.S. non-profit research institutions, and consortia of such institutions.
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grants or Cooperative Agreements
- **Estimated Number of Awards:** Not Specified.
- **Anticipated Funding Amount:** Up to \$25M is expected to be available, pending the availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** Supplemental Preparation Guidelines
 - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Deadline/Target Dates

- **Letter of Intent Due Date(s):** None
- **Preproposal Due Date(s):** None
- **Full Proposal Due Date(s):** January 31, 2001

D. FastLane Requirements

- **FastLane Submission:** Full Proposal Required
- **FastLane Contact(s):**
 - BIO FastLane, Office of Assistant Director for Biological Sciences, telephone: (703)292-8406, e-mail: biofl@nsf.gov.
 - Sarah Zielinski, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: biofl@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for

further information.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Directorate for Biological Sciences (BIO) of the National Science Foundation (NSF) announces its intention to support research to determine the function of all genes in the model plant *Arabidopsis thaliana* by the year 2010. This represents a continuation of the *Arabidopsis* genome research initiative BIO has supported for the last 10 years.

In 1990, plant scientists established an international research effort called "The Multinational Coordinated *Arabidopsis thaliana* Genome Research Project", by adopting the widespread use of an easily manipulated model plant called *Arabidopsis thaliana*. (For a long-range plan, see NSF 90-80.) One outcome of this effort is the entire DNA sequence of this plant, that will be completed before the end of 2000. For the first time, we will know the sequence of the 20,000 to 25,000 genes necessary for a flowering plant to function.

As a follow-up to the *Arabidopsis* genome sequencing efforts, and to take full advantage of the opportunities created by them, the community of plant biologists has proposed an important and revolutionary new initiative: to determine the function of all genes of a reference species within their cellular, organismal and evolutionary contexts by the year 2010 (the 2010 Project). Details can be found at <http://www.nsf.gov/cgi-bin/getpub?bio011> and <http://www.arabidopsis.org/workshop1.html>. In response, BIO has established the 2010 Project as a Directorate-wide activity. The 2010 Project is distinct from the Plant Genome Research Program (NSF00-151). All relevant BIO programs will be involved in reviewing and managing the 2010 Project proposals and awards.

One of the factors that contributed to the success of the Multinational Coordinated *Arabidopsis thaliana* Genome Research Project was world-wide collaboration among the researchers involved. The *Arabidopsis* research community has become a model for international research collaboration. It is expected that continued efforts by the international community of scientists will be essential for the success of the 2010 Project. NSF will foster activities to advance international collaboration and coordination of the 2010 Project.

II. PROGRAM DESCRIPTION

In FY2001, the 2010 Project will focus on the following activities:

Determination of gene function:

Individual investigators, or groups of investigators, will be supported to conduct creative and innovative research designed to determine, using all available means, the function of a network of genes in *Arabidopsis thaliana* of the investigator's interest and choice. The number of investigators involved in a single proposal should be determined by the scope and approach used in the proposal. The NSF expects that both large and small laboratories should be able to participate in the 2010 Project by taking advantage of various publicly available whole genome tools and resources.

Investigators are expected to have selected a set of genes as the subject of their research prior to the submission of a proposal. These genes must be identified in the proposal by GenBank accession number or by other identifiers from a publicly accessible database. The size of the selected gene set will depend on a number of factors, such as how the particular set was selected (e.g., based on a specific sequence motif or a set of genes expressed under a specific condition), and the interest and throughput capacity of the applicant. Genes being investigated by successful proposers will be publicly posted on a website at a registry to be developed with community input. This is intended to facilitate communication and coordination among the 2010 Project awardees, and between the awardees and the research community at large.

Proposals should provide a justification for selecting the specific gene set, describe how their functions are to be determined, and identify how and when the results will be released into the public domain.

Development of research tools and resources:

While the genome sequence and annotation information in public databases, microarray expression data at public websites, and a variety of biological resources at the *Arabidopsis* Biological Resource Center provide a good start for the community to begin the 2010 Project, NSF recognizes that additional tools and community biological resources are needed to enable individuals or groups of individuals in the scientific community to participate in the 2010 Project. Building the necessary, critical tools and biological resources will be supported, especially for the first few years of this project. Examples of such resources would include, but are not limited to, comprehensive sets of sequence indexed mutants, whole genome mapping chips, protein chips, and facile conditional expression systems for saturation screens for rare alleles.

These research tools must be made available to the entire scientific community in an easily accessible and useable form as soon as the appropriate quality check is completed. Therefore, intrinsic to any tools-building activity must be a strong informatics component that is well coordinated and integrated with other similar activities. The goal is to enable individual researchers to formulate a query of all the available resources so that they can make full use of the tools and resources that are in place as well as those that will become available in the future. Proposals must clearly state plans for how data, and outcomes such as gene identification, protein localization and the like, will be presented for easy access and retrieval by the entire research community.

Proposals for developing community resources must have a clear focus on service, and should not include research on the materials or information to be produced. They must also describe how the proposed activities are to be coordinated with related, ongoing activities so as to maximize the efficiency and the usefulness to the research community. A plan should be included for distribution of the materials or resources after the tenure of the NSF award.

Additional considerations:

Broadening participation: As in all other NSF programs, investigators are expected to integrate research and education in proposals submitted to the 2010 Project. Activities designed to encourage participation of investigators at small institutions, minority serving institutions,

community colleges, and secondary school teachers are especially encouraged.

Coordination between similar proposed projects: If two or more proposals with substantially overlapping goals and scope remain in consideration for funding after initial merit review, the PIs of those proposals may be asked to collaborate, and will be encouraged to submit a coordination plan prior to the final funding decision.

International opportunity: The 2010 Project encourages laboratory-to-laboratory interactions between US and foreign laboratories whenever such opportunities exist. However, NSF will provide funds for the US participation only in the international collaboration; foreign counterparts are expected to be supported by their own national sources.

Intellectual property: When the project involves the use of proprietary data or materials, any data or materials resulting from NSF-funded research must be made promptly and freely available, without any restrictions, to the users of such data or materials (no reach-through rights). It should be noted that prospective awardee institutions will be required, prior to an award decision, to submit copies of any intellectual property agreements or material transfer agreements that any of the key project personnel have signed, or are planning to sign, that would impact the unrestricted and timely distribution of the outcomes of the NSF-funded research. This material will be reviewed by NSF officials only, and will remain confidential. In the case of a multi-institutional proposal, the lead institution will be responsible for coordinating and managing the intellectual property resulting from the 2010 Project award.

III. ELIGIBILITY INFORMATION

Proposals are invited from U.S. academic institutions, U.S. non-profit research institutions, and consortia of such institutions with appropriate research and educational facilities (see GPG, Chapter I. Section C). When consortia of eligible individuals or institutions submit a proposal, it can be submitted as a single proposal with one institution serving as the lead institution or as a collaborative project (see GPG II.C.11.b).

IV. AWARD INFORMATION

It is anticipated that up to \$25 million will be made available for new awards in FY2001, contingent upon the quality of proposals received, and the availability of funds. The award size for proposals to determine gene function will be wide-ranging, and expected to be up to \$1 million per year for up to 4 years. Proposal budgets should be based on the realistic assessment of resources necessary to accomplish the stated proposal goals. Proposals with large budgets are expected to determine the function of a large number of genes.

The award size for proposals to build community resources is expected to be up to a total of \$3M for 2 years.

Funding decisions are anticipated by the end of July 2001, with awards expected to start in September 2001. Awards will be made either as grants or cooperative agreements.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS.

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?nsf012>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

Proposals must be submitted by FastLane (see "FastLane Submission" section below) and must follow guidelines described in the GPG. The following additions apply to proposals submitted to this Program:

Proposal Cover Sheet (NSF Form 1207): In the NSF FastLane system, follow instructions on proposal preparation. When completing the Cover Sheet, click on the GO button at "Program Announcement / Solicitation / Program Description No." Highlight NSF 01-13, 2010 Project, and click on the Select button. Your proposal will automatically be assigned to BIO – 2010 Project. You must then "Go Back" to the Cover Sheet Components Form and complete the remainder of the cover sheet.

BIO Proposal Classification Form (PCF): Complete the BIO PCF, available on the NSF FastLane system. The PCF is an on-line coding system that allows the Principal Investigator to characterize his/her project when submitting proposals to the Directorate for Biological Sciences. Once a PI begins preparation of his/her proposal in the NSF FastLane system, selects a division, cluster, or program within the Directorate for Biological Sciences as the first (or only) organizational unit to review the proposal, and saves the cover sheet, the PCF will be generated and available through the Form Preparation screen. Additional information about the BIO PCF is available in FastLane at <http://www.fastlane.nsf.gov/a1/BioInstr.htm>.

Project Summary (1 page): The project summary should consist of two parts in the following order: (1) a list of senior personnel (PI and Co-PIs appearing on the coverpage) along with home institutions; and (2) a summary of the proposed project in 500 words or less.

Project Description (maximum 15 pages including figures and tables): In addition to the standard description in GPG (Chapter II, Section C.3), the following guidelines must be followed:

- Results from Prior NSF Support (up to 5 pages): Only the most relevant prior awards should be listed in this section for any of the PIs and Co-PIs listed in "Project Summary".
- Justification: Briefly explain how the proposed activities meet the goals of the 2010 Project.
- **For proposals aimed at determining the function of a network of genes, the following information must be included in the project description:** (1) a list of genes to be studied identified by their accession numbers in GenBank or other identifiers in a

publicly accessible database; (2) why and how those genes were selected; (3) experimental plans to determine their function, including the level at which the functions are determined, e.g., the molecular/protein, biochemical, cellular, or higher levels; (4) how the investigators plan to add their results to the community-wide effort to update and add value to the primary sequence information in GenBank; and, (5) a projected timetable for accomplishing the stated proposal goals. If research tools and resources such as mutants and global expression data are produced during the course of the proposed project, the proposal should describe a plan for their public release and coordination with the existing distribution mechanisms.

- **For proposals aimed at building research tools and resources for the *Arabidopsis* functional genomics community, the following information must be included:** (1) a list of deliverables including necessary informatics tools; (2) experimental plans to develop the resources; (3) project timetable; (4) detailed plan for public release of the resources; (5) any conditions to be placed on users, e.g. material transfer agreement; and, (6) a plan to maintain and distribute the resource after NSF support has ended. It should be noted that resources (biological materials, software, etc.) produced with the support of NSF must be made available as soon as their quality is checked to satisfy the specifications described in the proposal and approved by reviewers. Further, they must be made available to all segments of the scientific community. Budgeting for short-term and long-term distribution of the project outcomes needs to be described in the proposal. A reasonable user charge is permissible, but the fee structure must be clearly outlined in the proposal. If accessibility differs between industry and the academic community, the differences must be clearly spelled out. It will be permissible to use a qualified commercial operation for long-term maintenance and distribution of the project outcome, if appropriate; however, such an arrangement should be clear in the proposal.
- Plan for integration of research and education within the context of the proposed activity.

Proposal Budget: Provide a summary budget and a yearly budget for the duration of the proposed project. When subawards are involved, signed summary and yearly budgets are required for each subaward. A Budget Justification should be provided for both the proposer and any subawardees. The 2010 Project program is fully committed to provide sufficient funds to complete any project it supports. A careful and realistic budget will add to the overall strength of a proposal. Funds for facility construction or renovation may NOT be requested.

Biographical Sketches: Provide the information requested in the GPG, Chapter II, Section C.5. for PI, Co-PIs, and other senior personnel requesting support in the proposed budget.

Special Information and Supplementary Documentation: With the exception of a "conflict of interest document" (see A-3) which should be sent directly to the 2010 Project, include the following materials, if applicable, in addition to the 15 page Project Description. Appendix materials should be clearly labeled and included in the Supplementary Documents section of FastLane.

(A-1) Management Plan (maximum 3 pages): **Each proposal involving 5 or more PIs (1 PI and 4 Co-PIs) OR proposing to develop community research tools and resources** must provide an additional description of the management plan for coordinating activities of the group

or the management of the service aspect. This description should include plans for internal means of communication, coordinating data and information management, evaluating and assessing progress, allocating funds and personnel, interacting with users in a service project, and other relevant issues specific to the proposed activities. The overall project leader (normally the PI) must be identified and his/her role should be described. Change of project leader will require prior NSF approval. For complex projects, appointment of a project manager/administrator in addition to the PI(s) is strongly encouraged. The exact time commitment of each key member to the project should be indicated in the management plan, regardless of whether any of his/her salary has been requested from NSF. A project timetable with yearly goals should be included for all projects, regardless of the number of personnel involved.

(A-2) Coordination with Outside Groups (maximum 2 pages): If the proposed activity is part of a national or international collaborative project, describe the relationship of the proposed activity to the overall collaborative project and how the components will be coordinated.

(A-3) A "conflict of interest" document must be sent directly to: the 2010 Project (Fax number – 703-292-9063; Address - DBI, Rm 615 National Science Foundation, 4201 Wilson Blvd, Arlington, VA 22230) within one week of the proposal submission deadline. Include a table, in the format shown below, that lists the names of persons with conflicts of interest for all senior personnel (PI and Co-PIs) and any named personnel whose salary is requested in the project budget. Conflicts to be identified are: (1) Ph.D. thesis advisor or advisee; (2) postdoctoral advisor or advisee; (3) collaborators or co-authors for the past 48 months; and, (4) any other individual or institution with which the investigator has financial ties (please specify). Organize the information as shown in the sample table shown below. List full names in each column in alphabetical order.

Last Name	First Name	Initial(s)	Conflict Type
Apple	Alison	A.	Ph.D. advisor for PI(name)
Barley	Barry	B.	Collaborator for Co-PI1(Name)
Raspberry	Rudy	R.	Financial ties for Co-PI2(Name)

(A-4) Color Images: Be advised that NSF cannot accommodate the printing of color images as part of proposal submission through the FastLane system, and submitted proposals that require the use of color or of very high resolution photographic images will necessitate additional steps. (See GPG Chapter I, Section E.1 "Special Instructions for....")

Provide only the allowable and applicable items as noted in the GPG, Chapter II, Section C.9. Include the materials in the FastLane submission by transferring them as .PDF files through the "Supplementary Docs" module of the FastLane system.

Proposals that are not compliant with the guidelines will not be reviewed. It is the submitting institution's responsibility to ensure that the proposal is compliant with all applicable guidelines.

Proposers are reminded to identify the program announcement/solicitation number (NSF 01-13) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing is not required in proposals submitted under this Program Solicitation .

C. Deadline/Target Dates

Proposals submitted in response to this announcement/solicitation must be submitted by 5:00 PM, local time on the following date(s):

January 31, 2001

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188.

Submission of Signed Cover Sheets. The signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible proof of mailing date assigned by the carrier) within five working days following proposal submission and be forwarded to the following address:

National Science Foundation
DIS – FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, VA 22230

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to

ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens — women and men, underrepresented minorities, and persons with disabilities — is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria

In evaluating proposals against the two general merit review criteria established by the

National Science Board, reviewers will look for sound and imaginative responses to the program description and the degree to which the proposed activities meet the overall goals of the 2010 Project.

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be assigned to the most relevant review panels within the Directorate of Biological Sciences, by matching the proposed activity with the panel's expertise. Awards will reside in an appropriate BIO cluster.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding 2010 Project should be made to:

- Dr. Machi F. Dilworth, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: bio2010@nsf.gov.
- Dr. Judith A. Verbeke, Division of Integrative Biology and Neuroscience, telephone: (703)292-8420, e-mail: bio2010@nsf.gov.
- Dr. Parag Chitnis, Division of Molecular and Cellular Biosciences, telephone: (703)292-8440, e-mail: bio2010@nsf.gov.
- Dr. James E. Rodman, Division of Environmental Biology, telephone: (703)292-8481, e-mail: bio2010@nsf.gov.
- Dr. Mary Jane Saunders, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: bio2010@nsf.gov.

For questions related to the use of FastLane, contact:

- BIO FastLane, Office of Assistant Director for Biological Sciences, telephone: (703)292-8406, e-mail: biofl@nsf.gov.
- Sarah Zielinski, Division of Biological Infrastructure, telephone: (703)292-8470, e-mail: biofl@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

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